

1 This listing of claims will replace all prior versions, and listings, of claims
2 in the application:

3
4 **Listing of Claims**

5
6 Claim 1 (Previously presented): A method for concealing data within a
7 digital signal, the method comprising:

8 receiving a first data pattern of discrete values which are bits of a
9 watermark and a second data pattern of discrete values which are bits of a covert
10 message;

11 imposing a discrete value of the second data pattern over one or more
12 discrete values of the first data pattern to generate a third data pattern, wherein the
13 imposing is carried out by performing a Boolean operation with a discrete value of
14 the second data pattern and multiple discrete values of the first data pattern;

15 processing the digital data signal into a series of bitframes, wherein each
16 bitframe includes a set of frames, and wherein each frame includes a set of blocks;
17 and

18 encoding the third data pattern into the digital signal, wherein a different bit
19 of the watermark is encoded in each frame of at least one subject bitframe, and
20 wherein a same bit of the covert message is encoded in each frame of the subject
21 bitframe.

22
23 Claims 2-3 (Canceled)
24
25

1 Claim 4 (Previously presented): A method as recited in claim 1, wherein
2 the Boolean operation is XOR.

3
4 Claim 5 (Previously presented): A method as recited in claim 1, wherein
5 a pattern of discrete values may be encoded into the digital signal in one of
6 multiple discrete states;

7 the imposing comprises encoding one or more multiple values of the first
8 data pattern into the digital signal into a state that indicates a single discrete value
9 of the second data pattern.

10
11 Claim 6 (Previously presented): A method as recited in claim 1, wherein
12 the digital signal is selected from a group consisting of a digital audio signal, a
13 digital video signal, a digital image signal, and a digital multimedia signal.

14
15 Claim 7 (Previously presented): A method as recited in claim 1, wherein
16 the different bit of the watermark which is encoded in a respective frame of the
17 subject bitframe, is repeated in each block of the respective frame.

18
19 Claim 8 (Previously presented): A computer having a computer-readable
20 medium as recited in claim 18.

21
22 Claim 9 (Previously presented): A method for revealing a covert data
23 pattern of discrete values from an encoded data pattern of discrete values in a
24 digital signal, the method comprising:

25

1 receiving a digital signal, the digital signal being segmented into a series of
2 bitframes which each include a set of frames, the digital signal having an encoded
3 data pattern of discrete values representing a first data pattern of discrete values
4 which are bits of a watermark, a different bit of the watermark encoded in each
5 frame of at least one subject bitframe, and a covert data pattern of discrete values
6 which are bits of a covert message, a same bit of the covert message encoded in
7 each frame of the subject bitframe; and

8 extracting a discrete value of the covert data pattern from a plurality of
9 values of the encoded data pattern, wherein the extracting is carried out by
10 decoding a single discrete value of the covert data pattern from the digital signal
11 based upon a state of a multiple discrete values of the encoded data pattern.

12
13 Claim 10-11 (Canceled)

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15 Claim 12 (Previously presented): A method as recited in claim 9, wherein
16 the digital signal is selected from a group consisting of a digital audio signal, a
17 digital video signal, a digital image signal, and a digital multimedia signal.

18
19 Claim 13 (Previously presented): A computer having a computer-readable
20 medium as recited in claim 19.

21
22 Claim 14 (Previously presented): A method for encoding a watermark with
23 a covert message into a digital audio signal, the method comprising:

24 encoding multiple binary bits of the watermark into frames of at least one
25 subject bitframe of the digital audio signal, a different one of the multiple binary

1 bits encoded into each of the frames, the multiple binary bits encoded into the
2 digital audio signal in multiple states; and

3 encoding a binary bit of the covert message over all the frames of the
4 subject bitframe of the digital audio signal, the binary bit of the covert message
5 indicating a single discrete value of the covert message.

6
7 Claim 15 (Previously presented): A method as recited in claim 14, wherein
8 the multiple states are positive or negative modifications to magnitudes of one or
9 more subbands in the frequency spectrum of a sample of the digital audio signal.

10
11 Claim 16 (Previously presented): A method for imposing a covert message
12 into a watermark, the method comprising:

13 generating multiple watermarks;

14 assigning each of the multiple watermarks to each of possible discrete
15 values for at least a portion of the covert message;

16 selecting a watermark that corresponds to an actual discrete value of at least
17 a specific portion of the covert message;

18 without encoding any portion of the covert message itself into a digital
19 signal, encoding the selected watermark into the digital signal.

20
21 Claim 17 (Previously presented): A method as recited in claim 16, wherein
22 size of all portions of the covert message is N bits long;
23 number of the multiple watermarks is 2^N .

1 Claim 18 (Previously presented): A computer-readable medium having
2 computer-executable instructions that, when executed by a computer, perform a
3 method for concealing data within a digital signal, the method comprising:

4 receiving a first data pattern of discrete values which are bits of a
5 watermark and a second data pattern of discrete values which are bits of a covert
6 message;

7 imposing a discrete value of the second data pattern over one or more
8 discrete values of the first data pattern to generate a third data pattern, wherein the
9 imposing is carried out by performing a Boolean operation with a discrete value of
10 the second data pattern and multiple discrete values of the first data pattern;

11 processing the digital signal into a series of bitframes, wherein each
12 bitframe includes a set of frames, and wherein each frame includes a set of blocks;
13 and

14 encoding the third data pattern into the digital signal, wherein a different bit
15 of the watermark is encoded in each frame of at least one subject bitframe, and
16 wherein a same bit of the covert message is encoded in each frame of the subject
17 bitframe.

18
19 Claim 19 (Previously presented): A computer-readable medium having
20 computer-executable instructions that, when executed by a computer, perform a
21 method for revealing a covert data pattern of discrete values from an encoded data
22 pattern of discrete values in a digital signal, the method comprising:

23 receiving a digital signal, the digital signal being segmented into a series of
24 bitframes which each include a set of frames, the digital signal having an encoded
25 data pattern of discrete values representing a first data pattern of discrete values

1 which are bits of a watermark, a different bit of the watermark encoded in each
2 frame of at least one subject bitframe, and a covert data pattern of discrete values
3 which are bits of a covert message, a same bit of the covert message encoded in
4 each frame of the subject bitframe; and

5 extracting a discrete value of the covert data pattern from a plurality of
6 values of the encoded data pattern, wherein the extracting is carried out by
7 decoding a single discrete value of the covert data pattern from the digital signal
8 based upon a state of a multiple discrete values of the encoded data pattern.

9
10 Claim 20 (Previously presented): An apparatus comprising:

11 a processor;

12 a covert-channel-encoder executable on the processor to:

13 receive a first data pattern of discrete values which are bits of a
14 watermark and a second data pattern of discrete values which are bits of a
15 covert message;

16 impose a discrete value of the second data pattern over one or more
17 discrete values of the first data pattern to generate a third data pattern,
18 wherein the imposition is carried out by performing a Boolean operation
19 with a discrete value of the second data pattern and multiple discrete values
20 of the first data pattern;

21 process the digital signal into a series of bitframes, wherein each
22 bitframe includes a set of frames, and wherein each frame includes a set of
23 blocks; and

24 encode the third data pattern into the digital signal, wherein a different bit
25 of the watermark is encoded in each frame of at least one subject bitframe, and

1 wherein a same bit of the covert message is encoded in each frame of the subject
2 bitframe.

3
4 Claim 21 (Previously presented): An apparatus comprising:
5 a processor;
6 a covert-channel-decoder executable on the processor to:
7 receive a digital signal, the signal having an a watermark encoded therein,
8 the watermark being an encoded data pattern of discrete values is encoded into the
9 signal in one of multiple discrete states, the encoded data pattern representing
10 multiple data patterns comprising an original watermark data pattern and a covert
11 data pattern;
12 extract a discrete value of the covert data pattern from a plurality of values
13 of the encoded data pattern, wherein the extraction is carried out decoding a single
14 discrete value of the covert data pattern from the digital signal based upon a state
15 of a multiple discrete values of the encoded data pattern.

16
17 Claim 22 (Previously presented): A data encoding system for concealing
18 data within a digital signal, the system comprising:

19 a receiver for receiving a first data pattern of discrete values which are bits
20 of a watermark and a second data pattern of discrete values which are bits of a
21 covert message;

22 an imposer coupled to such receiver, the imposer for imposing a discrete
23 value of the second data pattern over one or more discrete values of the first data
24 pattern to generate a third data pattern, wherein the imposer carries out its
25

1 imposing by performing a Boolean operation with a discrete value of the second
2 data pattern and multiple discrete values of the first data pattern;

3 an encoder coupled to the receiver and the imposer, the encoder for
4 inserting within the digital signal one or more values of the third data pattern
5 which are results of the imposer's imposing a discrete value of the second data
6 pattern over one or more values of the first data pattern, wherein a different bit of
7 the watermark is encoded in each frame of at least one subject bitframe, and
8 wherein a same bit of the covert message is encoded in each frame of the subject
9 bitframe.

10
11 Claim 23 (Canceled)

12
13 Claim 24 (Previously presented): A marked signal embodied on a
14 computer-readable medium, the marked signal having an encoded data channel
15 therein, wherein such encoded data channel has a covert data channel imposed
16 therein, the marked signal generated in accordance with the following acts:

17 receiving an original watermark data pattern of discrete values which are
18 bits of a watermark and a covert data pattern of discrete values which are bits of a
19 covert message;

20 imposing a discrete value of the covert data pattern over one or more
21 discrete values of the original watermark data pattern to generate a third data
22 pattern, wherein the imposing carries out its imposing by performing a Boolean
23 operation with a discrete value of the covert data pattern and multiple discrete
24 values of the watermark data pattern;

1 processing a digital signal into a series of bitframes, wherein each bitframe
2 includes a set of frames, and wherein each frame includes a set of blocks; and
3 encoding the third data pattern into the digital signal to generate the marked
4 signal, wherein a different bit of the watermark is encoded in each frame of at least
5 one subject bitframe, and wherein a same bit of the covert message is encoded in
6 each frame of the subject bitframe.

7
8 Claim 25 (Canceled)

9
10 Claim 26 (Previously presented): A marked signal as recited in claim 24,
11 wherein the Boolean operation is XOR.

12
13 Claim 27 (Previously presented): A marked signal as recited in claim 24,
14 wherein

15 a pattern of discrete values may be encoded into the signal in one of
16 multiple discrete states;

17 the imposing comprises encoding one or more multiple values of the first
18 watermark data pattern into the digital signal into a state that indicates a single
19 discrete value of the second covert data pattern.

20
21 Claim 28 (Previously presented): A marked signal as recited in claim 24,
22 wherein the marked signal is selected from a group consisting of a digital audio
23 signal, a digital video signal, a digital image signal, and a digital multimedia
24 signal.

1 Claims 29-34 (Canceled)

2
3 Claim 35 (Previously presented): A method for concealing data within a
4 digital signal, the method comprising:

5 receiving a first data pattern of discrete values which are bits of a
6 watermark and a second data pattern of discrete values which are bits of a covert
7 message;

8 imposing a single discrete value of the second data pattern on a plurality of
9 values of the first data pattern, wherein the imposing encodes a third data pattern
10 into the digital signal, wherein a different bit of the watermark is encoded in each
11 frame of at least one subject bitframe of the digital signal, wherein a same bit of
12 the covert message is encoded in each frame of the subject bitframe of the digital
13 signal.

14
15 Claim 36 (Previously presented): A method as recited in claim 35, wherein
16 the imposing comprises performing a Boolean operation with a discrete value of
17 the second data pattern and a plurality of values of the first data pattern.

18
19 Claim 37 (Previously presented): A method as recited in claim 35, wherein
20 the imposing comprises XORing a discrete value of the second data pattern with a
21 plurality of values of the first data pattern.

22
23 Claim 38 (Previously presented): A method as recited in claim 35, wherein
24 a pattern of discrete values may be encoded into the digital signal in one of
25 multiple discrete states;

1 the imposing comprises encoding a plurality of values of the first data
2 pattern into the digital signal into a state that indicates a single discrete value of the
3 second data pattern.
4

5 Claim 39 (Previously presented): A method as recited in claim 35, wherein
6 the digital signal is selected from a group consisting of a digital audio signal, a
7 digital video signal, a digital image signal, and a digital multimedia signal.
8

9 Claim 40 (Previously presented): A method as recited in claim 35, wherein
10 the first data pattern is a watermark.
11

12 Claim 41 (Previously presented): A computer-readable medium having
13 computer-executable instructions that, when executed by a computer, performs the
14 method as recited in claim 35.
15

16 Claim 42 (New): A method for concealing data within a digital signal,
17 the method comprising:

18 receiving (1) a first data pattern of discrete values which are bits of a
19 watermark that cannot be identified and manipulated, and repeated throughout the
20 digital signal; and (2) a second data pattern of discrete values which are bits of a
21 covert message conveying a message that is not repeated throughout the digital
22 signal;

23 imposing a discrete value of the second data pattern over one or more
24 discrete values of the first data pattern to generate a third data pattern, wherein the
25

1 imposing is carried out by performing a Boolean operation with a discrete value of
2 the second data pattern and multiple discrete values of the first data pattern;

3 processing the digital data signal into a series of bitframes, wherein each
4 bitframe includes a set of frames, and wherein each frame includes a set of blocks;
5 and

6 encoding the third data pattern into the digital signal, wherein a different bit
7 of the watermark is encoded in each frame of at least one subject bitframe, and
8 wherein a same bit of the covert message is encoded in each frame of the subject
9 bitframe.